

Concept Note

Promoting hybrid power generation plants with thermal and solar energy in rural zone in Niger Phase I

Banque Ouest Africaine de Développement (BOAD) | Niger

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Concept Note

Project/Programme Title:	Promoting hybrid power generation plants with thermal and solar energy in rural zone in Niger Phase I
Country(ies):	Niger
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Accredited Entity(ies) (AE):	Banque Ouest Africaine de Développement (BOAD)
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Notes

- The maximum number of pages should **not exceed 12 pages**, excluding annexes. Proposals exceeding the prescribed length will not be assessed within the indicative service standard time of 30 days.
- As per the Information Disclosure Policy, the concept note, and additional documents provided to the Secretariat can be disclosed unless marked by the Accredited Entity(ies) (or NDAs) as confidential.
- The relevant National Designated Authority(ies) will be informed by the Secretariat of the concept note upon receipt.
- NDA can also submit the concept note directly with or without an identified accredited entity at this stage. In this case, they can leave blank the section related to the accredited entity. The Secretariat will inform the accredited entity(ies) nominated by the NDA, if any.
- Accredited Entities and/or NDAs are encouraged to submit a Concept Note before making a request for project preparation support from the Project Preparation Facility (PPF).
- Further information on GCF concept note preparation can be found on GCF website [Funding Projects Fine Print](#).

A. Project/Programme Summary (max. 1 page)			
A.1. Project or programme	<input checked="" type="checkbox"/> Project <input type="checkbox"/> Programme	A.2. Public or private sector	<input checked="" type="checkbox"/> Public sector <input type="checkbox"/> Private sector
A.3. Is the CN submitted in response to an RFP?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> If yes, specify the RFP:	A.4. Confidentiality¹	<input type="checkbox"/> Confidential <input checked="" type="checkbox"/> Not confidential
A.5. Indicate the result areas for the project/programme	<p>Mitigation: Reduced emissions from:</p> <input checked="" type="checkbox"/> Energy access and power generation <input type="checkbox"/> Low emission transport <input type="checkbox"/> Buildings, cities and industries and appliances <input type="checkbox"/> Forestry and land use <p>Adaptation: Increased resilience of:</p> <input checked="" type="checkbox"/> Most vulnerable people and communities <input checked="" type="checkbox"/> Health and well-being, and food and water security <input type="checkbox"/> Infrastructure and built environment <input type="checkbox"/> Ecosystem and ecosystem services		
A.6. Estimated mitigation impact (tCO₂eq over lifespan)	429 474 t CO ₂ eq	A.7. Estimated adaptation impact (number of direct beneficiaries and % of population)	50 000
A.8. Indicative total project cost (GCF + co-finance)	Amount: USD 15 841 000	A.9. Indicative GCF funding requested	Amount: USD 9 765 000
A.10. Mark the type of financial instrument requested for the GCF funding	<input checked="" type="checkbox"/> Grant <input type="checkbox"/> Reimbursable grant <input type="checkbox"/> Guarantees <input type="checkbox"/> Equity <input type="checkbox"/> Subordinated loan <input type="checkbox"/> Senior Loan <input type="checkbox"/> Other: specify _____		
A.11. Estimated duration of project/ programme:	a) disbursement period: b) repayment period, if applicable:	A.12. Estimated project/ Programme lifespan	This refers to the total period over which the investment is effective.
A.13. Is funding from the Project Preparation Facility requested?²	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Other support received <input type="checkbox"/> If so, by who:	A.14. ESS category³	<input type="checkbox"/> A or I-1 <input checked="" type="checkbox"/> B or I-2 <input type="checkbox"/> C or I-3
A.15. Is the CN aligned with your accreditation standard?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	A.16. Has the CN been shared with the NDA?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
A.17. AMA signed (if submitted by AE)	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> If no, specify the status of AMA negotiations and expected date of signing:	A.18. Is the CN included in the Entity Work Programme?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
A.19. Project/Programme rationale, objectives and approach of programme/project (max 100 words)	<p>Brief summary of the problem statement and climate rationale, objective and selected implementation approach, including the executing entity(ies) and other implementing partners.</p> <p>In Niger, access to energy services is low (on average 10% in 2014). In rural areas, only four out of every 1000 rural inhabitants have access to electricity. Domestic production is not only very low (17.26% in 2014), but remains unsustainable from an environmental and financial point of view. The share of renewable energies in the energy mix was only</p>		

¹ Concept notes (or sections of) not marked as confidential may be published in accordance with the Information Disclosure Policy ([Decision B.12/35](#)) and the Review of the Initial Proposal Approval Process ([Decision B.17/18](#)).

² See [here](#) for access to project preparation support request template and guidelines

³ Refer to the Fund's environmental and social safeguards ([Decision B.07/02](#))

0.012% in 2014. This situation hardly reflects the country's potential in renewable energies, especially solar energy. The project, which constitute the phase I, aims to increase access to energy services in rural areas through low-carbon energy promoting.

B. Project/Programme Information (max. 8 pages)

B.1. Context and baseline (max. 2 pages)

Describe the climate vulnerabilities and impacts, GHG emissions profile, and mitigation and adaptation needs that the prospective intervention is envisaged to address.

The energy sector faces enormous challenges, including generating enough energy to support socio-economic development while contributing to the mitigation of greenhouse gas emissions. In Niger, access to energy services is low on average 10% in 2014. The country's external dependence on the supply of energy services remains strong and growing (73.82% in 2013 and 77.26% in 2014). Energy deficits resulting in untimely cuts are chronic and consequences for the socio-economic development of the country remain significant.

According to the national study of the basic situation of Niger in the framework of the acceleration of the implementation of the Regional Policies on Clean Energies in West Africa (September 2016), more than half of the townsfolk have no access to electricity, and only four out of thousand rural inhabitants have access to electricity. Villages are poorly served because of low production and because they are generally far from the network with scattered habitat. These populations remain deprived of the basic energy services which are called to support the socio-economic development of the rural world. Domestic production is indeed not only very low (17.26% in 2014), but remains unsustainable from an environmental and financial point of view. The share of renewable energy in the energy mix was only 0.012% in 2014. This situation hardly reflects the country's potential in terms of renewable energy resources, especially solar energy.

This project is therefore initiated to promote rural electrification through solar energy. It will provide sober energy services to rural non-electrified communities for sustainable socio-economic development.

Please indicate how the project fits in with the country's national priorities and its full ownership of the concept. Is the project/programme directly contributing to the country's INDC/NDC or national climate strategies or other plans such as NAMAs, NAPs or equivalent? If so, please describe which priorities identified in these documents the proposed project is aiming to address and/or improve.

This project aligns with the priorities identified by the Nationally Determined Contribution (CDN) in terms of GHG mitigation.

The project is consistent with the Declaration of Energy Sector Policy "dated 4 August 2014. In this version, the Policy states that" in view of the low level of access to modern energy services and the driving role of energy in sustainable development, the Government is committed to rapidly increasing efforts to ensure the population's well-being and the country's economic growth. The overall objective of energy policy is to contribute to poverty reduction through sustainable access to modern energy services in the socio-economic sectors. The orientations of the national energy policy are divided along the following lines: (i) the guarantee of the security of energy supply in the long term; (ii) contribution to social and territorial cohesion by ensuring access to energy for everyone at an affordable price; (iii) the valorization of national energy resources; (iv) the preservation of the environment; and (v) building the capacity of the actors of the energy sector.

The project is also consistent with the National Action Plan for Sustainable Energy for All by 2030 (PAN / SE4ALL-Niger) drawn up in March 2015. It aims at a development objective related to food security, gender equality and poverty reduction in Niger. In connection with the global initiative SE4ALL-2030, it aims to achieve universal access to electricity by 2030, namely: (i) at the national level, a rate of access to electricity rising from 8.6 % in 2010 (for a population of 15,204 million) to 100% in 2030 (for a population of 32 million); (ii) in urban areas, a rate of access to electricity rising from 47% in 2010 (for an urban population of 3,102 million inhabitants) to 100% in 2030 (for an urban population of 6.6 million inhabitants); and (iii) in rural areas, a rate of access to electricity rising from 0.4% in 2010 (for a rural population of 12.1 million) to 100% in 2030 (for a population of 25%), 7 million inhabitants).

Describe the main root causes and barriers (social, gender, fiscal, regulatory, technological, financial, ecological, institutional, etc.) that need to be addressed.

The barriers to be overcome in this project are technical, financial and also related to access to information.

Technical barrier: renewable energy technologies are new and not yet known to mastery by energy technicians at the national level. The national technical capacities especially local for the assembly, the repair or the maintenance of the solar equipment's are very limited.

Technology supply chain: The technology supply chain for RE in Guinea-Bissau is at a very nascent stage. There are a few local SMEs capable of assembling simple RE installations based on imported machinery, but they lack the technical and engineering capacities to ensure optimal system design, installation and maintenance. In the rural areas, there is only very limited local technical expertise available on how to properly administer, operate and maintain RE based mini-grids. The low quality and quantity of skilled and competent workers in the power sector adds additional risks and increases the cost of mini-grid operation due to the need to rely on expensive imported services even for basic repair and maintenance.

Financial barrier: Generally, the acquisition cost of solar equipment is relatively important. However, there is a lack of capacity in the private sector to finance solar photovoltaic projects in villages due to lack of capital, lack of financial assets, and lack of fundraising capabilities. In addition, the risk of default is higher. This situation is explained by the fact that the majority of the poor and vulnerable populations are located in the villages. The production of energy from renewable sources has undeniable advantages, but the costs of their implementation remain a real constraint on their expansion. This significantly limits access to clean energy by rural people.

Low level of knowledge about renewable energies: the advantage to using renewable energy is well established. However, in remote areas, where access to information is not easy, people and some actors are not sufficiently informed. As a result, there is a lack of awareness both of the new policies (which will be validated) for the promotion of renewable energies and the economic benefits of the feasibility of solar photovoltaic projects in villages. Demonstration projects will also raise public awareness of the benefits of solar PV for villages.

Where relevant, and particularly for private sector project/programme, please describe the key characteristics and dynamics of the sector or market in which the project/programme will operate.

B.2. Project/Programme description (max. 3 pages)

Describe the expected set of components/outputs and subcomponents/activities to address the above barriers identified that will lead to the expected outcomes.

The proposed project will focus on the following three components: (i) strengthening the technical and organizational capacities of stakeholders; (ii) support for access to low-carbon energy services; and (iii) knowledge sharing, monitoring and evaluation and dissemination of lessons learned.

Project components and related activities are summarized below :

Component 1: Strengthening the technical and organizational capacities of stakeholders

- Activity 1.1. Training of young technicians in rural areas in the construction and maintenance of small solar units;
- Activity: 1.2. : Organization of awareness campaigns for development actors and grassroots communities for the promotion of solar energy
- Activities 1.3: Organization of banks and financial institutions to support young groups of energy engineers for the development of solar energy ;

Component 2: Support for access to low-carbon energy services for socio-economic development. This component aims to develop the national potential in solar energy to contribute to the socio-economic development of the beneficiary villages.

- Activity 2.1. : Supply and installation of solar kits for lighting with: (i) the distribution of 50,000 kits of solar lamps chargeable to households in order to contribute to the formation of human capital; (ii) the construction of 200 drinking water supply points equipped with solar systems; (iii) the supply of 100 solar kits for schools; (iv) the equipment of 100 community solar health centers for the care and preservation of certain products.
- Activity 2.2. Support for the development of socio-economic activities with: (i) the supply of 300 solar kits (solar panels and solar pumps) for the development of market gardening by groups of young people and women; (ii) support for the establishment of micro-valorization units for agricultural products.
- Activity 2.3. : Support for small agro-industries for young entrepreneurs through the hybridization of 100 diesel generators with the development of the solar photovoltaic and agricultural products market.

Component 3: Knowledge sharing and dissemination of lessons learned.

This component aims to promote a strong penetration of renewable energies in the supply of energy services. The planned activities under this component are :

- Knowledge sharing and capitalization of lessons learned;
- Dissemination of lessons learned to extend the impact of the project and its replication.

In terms of rationale, please describe the theory of change and provide information on how it serves to shift the development pathway toward a more low-emissions and/or climate resilient direction, in line with the Fund's goals and

objectives.

This project will contribute to a change of practice in the delivery of energy services in Niger. As a reminder, the rate of renewable energy in the energy mix is only 0.012%. The rest of the energy is supplied either by production from thermal power stations or by import into neighboring countries. Villages, as they are generally far from the electricity distribution grid, are served, though small, by mini-thermal power plants that run on fossil fuels that contribute to increased GHG emissions. In others localities they use mini-generators. The solar village promotion approach will help limit the use of fossil fuels and avoid GHG emissions. This project involves decentralized electrification in order to promote access to clean energy services for sustainable socio-economic development in rural areas. Usually, in remote villages, the majority of market gardeners use motor pumps for the drainage of water for crop irrigation. With the provision of solar kits for the development of market gardening, beneficiaries will gain more value from their lucrative activities.

Describe how activities in the proposal are consistent with national regulatory and legal framework, if applicable.

The project will be carried out in accordance with the regulations in force in the country and the required international standards. At the national level, this is: (i) the Law No. 2016-05 on the Electricity Code; (ii) the Law No. 98-56 on the Framework Law on Environmental Management.

Law No. 2016-05 on the Electricity Code: It governs the production, transport, import, export, transit, distribution and marketing of electrical energy from all primary and secondary sources in the Republic of Niger. Article 51 stipulates that the State ensures the promotion and development of renewable energies to significantly increase their share of the country's energy mix. The development of renewable energies aims at the introduction and promotion of processing and manufacturing of exploitable equipment. The conditions, modalities and mechanisms of design, adaptation research and development, quality control and maintenance of exploitable equipment as well as the financing of projects are set by regulation. Article 52 states that the State may use mechanisms to promote renewable energies and encourage public-private partnerships. Article 60 stipulates that the establishment of works for the production, transmission and distribution of electrical energy is subject, in addition to the rules laid down in Title III above, to the following conditions: (i) electrical works must be compatible with equipment such as the water regime, telecommunications, broadcasting and navigation (air, land, rail and waterways); (ii) electrical installations, appliances and equipment are governed by the laws and regulations in force in respect of safety and environmental protection. Similarly, projects of works must be compatible with the protection of monuments, protected sites and landscapes. For this purpose, the construction work of electrical works in protected areas such as reserves, parks can only take place after obtaining an authorization issued by the authority in charge of the protection of the environment.

Law No. 98-56 on the Framework Law on Environmental Management: Article 31 of the law stipulates that: "Activities, projects and development programs which, because of their size or their impact on the natural and human environments, may be detrimental to the latter are subject to prior authorization by the Government. Minister responsible for the environment [...] ". Section 37 of the Act prohibits the impairment of air quality or any form of modification of its characteristics that could affect public health or the preservation of property, to emit into the air any polluting substance, in particular fumes, dust or toxic gases, beyond the limits fixed by the implementing provisions of this Act. Article 41 states that the Ministry of the Environment shall ensure the implementation of international conventions on the protection of the atmosphere and the fight against global warming, including the United Nations Convention on the Protection of the Environment on climatic changes. On the other hand, Article 52 of the Act states that the soil, the subsoil and the riches contained therein, whether as renewable or non-renewable resources, are protected against all forms of degradation and managed in a rational manner. In addition, Article 53 stipulates that the public authorities may, in accordance with the legislation in force, prohibit work harmful to the soil, subsoil or ecological balance and submit certain operations to a prior authorization.

Describe in what way the Accredited Entity(ies) is well placed to undertake the planned activities and what will be the implementation arrangements with the executing entity(ies) and implementing partners.

The BOAD will be the implementation entity of the project. It is a development bank with sufficient capacity to ensure the implementation of renewable energy and climate resilient agriculture projects. The project will be implemented by the Nigerian Agency for the Promotion of Rural Energy (ANPER). The coordination of aspects related to climate change will be provided by the National Council for the Environment for Sustainable Development (CNEDD).

Please provide a brief overview of the key financial and operational risks and any mitigation measures identified at this stage.

B.3. Expected project results aligned with the GCF investment criteria (max. 3 pages)

The GCF is directed to make a significant and ambitious contribution to the global efforts towards attaining the goals set by the international community to combat climate change, and promoting the paradigm shift towards low-emission and

climate-resilient development pathways by limiting or reducing greenhouse gas emissions and adapting to the impacts of climate change.

GCF core indicators	<i>Expected tons of carbon dioxide equivalent (t CO₂ eq.) to be reduced or avoided (Mitigation only)</i>	429 474 t CO ₂ eq
	<i>Expected total number of direct and indirect beneficiaries (reduced vulnerability or increased resilience); number of beneficiaries relative to total population (adaptation only)</i>	50 000
Other relevant indicators	<i>Expected increase in the number of households with access to low-emission energy</i>	7 140

Provide an estimate of the expected impacts aligned with the GCF investment criteria: impact potential, paradigm shift, sustainable development, needs of recipients, country ownership, and efficiency and effectiveness.

1 Impact potential :

This project is in line with GCF mitigation impacts. Through component 2 "Support for access to low-carbon energy services for socio-economic development" in its activities 2.2 and 2.3, the project will prevent greenhouse gas emissions. In the project area, on average, a motor pump is used for the development of 0.25 ha of crops. Each motor pump consumes 7.5 liters of fuel per day for optimal irrigation. Considering that a crop year lasts on average 90 days of irrigation, fossil fuel consumption would be 2,700 liters / ha / crop year. Assuming that 1 solar kit covers 5 ha, activity 2.2 will avoid around 4 050 000 liters for a total of 1500 ha. That is about 10 732.5 t CO₂eq / year. The support of small agro-industries by the hybridization of 100 diesel generators with the development of the solar photovoltaic market will prevent the emission of 10740.6 t CO₂ eq. In total the emission 21 473.7 t CO₂ eq / year will be avoided per year is 429 474 t CO₂ eq throughout the life of solar equipment (20 years). It should be emphasized that this assessment is underestimated because it does not take into account the amount of CO₂ that will be avoided under activity 2.1.

Based on the fact that the activities of this project have widespread positive impacts, all the inhabitants of the villages concerned will be direct beneficiaries. Assuming that a beneficiary village has an average population of 500, the direct beneficiaries of this project are estimated at 50,000. In an indirect way, the project will also improve the living conditions of neighboring villages.

2 Paradigm shift potentiel :

The primary vision of this project is to improve access to solar energy in the beneficiary villages. It is sought through this project to move from kerosene lamps, fossil-fueling groups and pollutant battery torches to solar energy production for drinking water needs, irrigation and the micro-enterprises development that did not exist in the beneficiaries' villages.

As a result, it has significant potential for replication. It will allow the change of habit and behavior of the beneficiaries. Capacity-building actions, through training and sensitization on renewable energies, in this case solar energy, will improve the players' understanding. During the various training and awareness sessions, the focus will be on the replicability aspect of the proposed actions. The support to small agro-industries of young entrepreneurs through the hybridization of 100 diesel generators with the development of the solar photovoltaic market and agricultural products will enable them to reduce their cost of production. This will allow them to expand and improve their business. As part of this project, successful entrepreneurs will be monitored to help youth in the replicability and expansion of different agro-industries. Support for the development of socio-economic activities will support and strengthen the resilience of beneficiaries and contribute to the scaling up of activities.

With regard to learning and knowledge management, this project through its component 1 "strengthening the technical and organizational capacities of stakeholders" will aim to improve the level of knowledge and information of stakeholders on beneficiaries through training, sensitization and capacity building. These different activities will enable the different actors to assimilate and appropriate the techniques of construction and maintenance of the installations. Knowledge sharing and learning will primarily be based on a project knowledge management strategy, with targeted communication activities. As a result, the media, the journalist and other actors in the dissemination and sharing of information will be affected. Given the importance of dissemination and sharing of lessons, this project provides component 3 for monitoring and evaluation and disseminating lessons learned.

3. Sustainable development potential

Economic co-benefits: improving the living and working conditions of people in the project area through support for the development of socio-economic activities such as market gardening, processing of products will create jobs and improve the income of the beneficiaries. This project will also enable the Nigerian government to reduce its budget

deficit by reducing public spending on access to energy. The project also focuses on the promotion of micro-enterprises which will improve the country's tax base in the long term. Because most income-generating activities evolve in the informal sector.

Social co-benefits: The supply and installation of solar kits for lighting through the distribution of 50,000 kits of solar lamps chargeable to households; 100 solar kit for schools will improve the education level of the populations. This will allow the beneficiary villages to start a good development because education is at the base of all development. The construction of 200 drinking water supply points equipped with solar energy will improve access to drinking water for beneficiary populations. This will help the Nigerian state to easily reach targets 6 and 7 of the Sustainable development objectives (SDO) namely access to safe water and sanitation and the use of renewable energy. Equipping 100 community health centers with solar energy for the care and preservation of certain products will improve access to quality care for the population. This will significantly improve attendance at health centers and reduce infant and neonatal mortality in beneficiary villages.

Co-environmental benefits: This project promotes solar energy in agricultural sectors, especially market gardening and agro-food. This approach contributes significantly to the protection of the environment and improves the living environment of the beneficiaries by: (i) improving air quality by reducing emissions of nitrogen oxides, volatile organic compounds non-methane and sulfur dioxide power plants based on the proportion of clean energy produced; (ii) increase the resilience of the population to climate change through the increased of renewable energy produced locally; (iii) the reduction and avoidance of GHG emissions that would otherwise be generated by diesel to meet the energy needs of households and small industries in the intervention areas. It should also be noted that the project contributes to climate change mitigation efforts by meeting electricity needs with clean energy.

Gender-sensitive development impact: The project will enable women and especially girls to develop and flourish through access to equitable education. Access to quality health care and improvement of their standard of living through support for the development of socio-economic activities such as the processing and valorization of agricultural products. In any society, water management is a women's business. As a result, the present project, through the construction of 200 drinking water supply points equipped with solar systems, will objectively involve women in the planning and implementation of activities. An important place will be given to women in the management of the water supply infrastructure in order to be in phase with the principle 3 of integrated management of water resources "Women play a central role in the supply, the management and safeguarding of water ". Strengthening the capacities of young people and women in the creation of renewable energy companies, particularly in solar energy, will enable this already vulnerable layer to improve their participation in village development. The application of women to the workplace and their participation in management committees will be strongly encouraged. When selecting stakeholder capacity building, the gender criterion will be included to give women, youth and adults the opportunity to participate actively in the project. Jobs will be created for women since the preparation and implementation of the project. Studies have shown that the number of women in villages is greater than that of men. As a result, at least 50% of direct and indirect beneficiaries will be women.

4. Needs of recipient:

In Niger, the effect of climate change on populations and resources is well established. It goes from degradation and vulnerability of resources to the worsening of poverty especially in rural areas. It must be recognized that, in general, sectoral and local actions to anticipate and integrate risks and opportunities related to climate change are limited. These actions deserve more attention, capacity in terms of human resources and more mobilization of financial resources. The objectives set by the Nigerian state in the INDC highlight the country's ambitions. According to the INDC, adaptation is essential for the country but nevertheless, to participate in the mitigation efforts of the international community, the country favors adaptation actions with strong co-benefits. According to the second national communication on climate change, the energy sector is considered a major source of greenhouse gas (GHG) emissions. In terms of Global Warming Potential (GWP), these emissions represent 8.51% of total emissions, ie 2622 Gg of CO₂ eq. It should be noted that the energy sector is dominated by the predominant consumption of the domestic energy sub-sector, mainly based on wood resources (wood and biomass residues). Indeed, these woody resources represent 90% of the energy balance against 8% for hydrocarbons and 2% for electricity. This situation contributes significantly to the degradation of the forest cover. The potentialities of renewable energies (solar, wind, hydro) are very important, but little exploited so far.

This project proposed to the GCF for this phase will focus on the most vulnerable villages exposed to climate change. It therefore aims at the most vulnerable layers through improving access to clean energy, support for the development of socio-economic activities. But in its National Action Program for Adaptation to Climate Change, the country recognized that mitigation in the energy sector requires heavy investment to facilitate access to cheap, sustainable and clean energy. For some time, the Nigerian state has been making efforts to improve the conditions for access to clean energy by vulnerable populations through projects. This is not without effect on the level of indebtedness of the country.

Resource mobilization across traditional banks has a considerable effect on the country's debt. Banks are also reluctant to support vulnerable populations in the implementation of clean energy projects. If necessary, these loans are usually

made through loans with a high interest rate. Since the beneficiaries are poor and vulnerable, the reimbursement will be an additional problem.

The strategic approach of this project is to improve the living conditions and living standards of vulnerable populations through the integration of solar energy in the development of socio-economic activities and basic social services. With little or no knowledge of solar energy from beneficiaries and to a lesser extent from development actors, this project will place a particular emphasis on the domestication of technology. This domestication or appropriation of technology will be done through capacity building and training of all actors involved in the promotion and popularization of renewable energies. Training will be organized to support the control of the use of solar energy. Therefore, this project reserves component 1 for capacity building of stakeholders as a whole.

5. Country ownership :

This project is consistent with the objectives of the Energy Policy Statement. The first objective of the Energy Policy Statement is to promote access for the poor to the modern energy service. It is also important to highlight the alignment of the project with the following climate strategies and mitigation / adaptation priorities: (i) national communications and sector strategies; (ii) the contribution determined at the national level (INDC); (iii) National Action Plan for Renewable Energy and Energy Efficiency (SE4ALL); (iv) National Action Plan for Adaptation to Climate Change (NAPA); the National Environment Plan for Sustainable Development (PNEDD); the Poverty Reduction Strategy (PRS). The Nigerian state's ambitions for renewable energy are reflected in the National Action Plan for Renewable Energy and Energy Efficiency (SE4ALL). These include: Installation of 150MW of solar capacity connected to the grid and 100MW off grid; the use of 30% renewable energies in the national energy mix (excluding biomass); 30% of the rural population connected by renewable off-grid installations etc. In this project, the participative, formative approach and socio-economic development through the involvement of entrepreneurs will allow the ownership of the project over the medium and long term and will enable Niger to meet its mitigation objectives.

6. Efficiency and effectiveness:

The project will improve the living conditions of beneficiaries while strengthening their resilience. This will help support the development of villages. Through the activities developed in Component 2, this project will significantly reduce greenhouse gas emissions. A total of 21 473.7 t CO₂ eq / year will be avoided per year, ie 429 474 t CO₂ eq throughout the lifespan of solar equipment (20 years). Considering the financing requested from GCF, ie US \$ 9 765 000, the cost per ton of CO₂ is US \$ 22.7. Considering the financing requested from GCF for the component 2 activities, ie US \$ 7 000 000, the cost per ton of CO₂ would be US \$ 16.29.

B.4. Engagement among the NDA, AE, and/or other relevant stakeholders in the country (max ½ page)

Please describe how engagement among the NDA, AE and/or other relevant stakeholders in the country has taken place and what further engagement will be undertaken as the concept is developed into a funding proposal.

The project has been identified and structured with a strong involvement of the NDA of the Green Fund in Niger, BOAD and government institutions. Several exchange and working meetings took place between these different institutions during the preparation of this concept note. We must also note the need expressed by the Nigerien population for access to energy. As a result, these needs have also been taken into account in project identification.

C. Indicative Financing/Cost Information (max. 3 pages)

C.1. Financing by components (max ½ page)

Please provide an estimate of the total cost per component/output and disaggregate by source of financing.

Component/Output	Indicative cost (USD)	GCF financing		Co-financing		
		Amount (USD)	Financial Instrument	Amount (USD)	Financial Instrument	Name of Institutions
Component 1: Strengthening the technical and organizational capacities of stakeholders	1 300 000	1 000 000	Grant	300 000	Loan	BOAD
Component 2: Support for access to	12 000 000	7 000 000	Grant	5 000 000	Loan	BOAD

low-carbon energy services for socio-economic development.						
Component 3: Knowledge sharing and dissemination of lessons learned	1 300 000	1000 000	Grant	300 000	Loan	BOAD
Project Activities cost	14 600 000	9 000 000		5 600 000		
Project Management (8.5%)	1 241 000	765 000	Grant	476 000	Loan	BOAD
Indicative total cost (USD)	15 841 000	9 765 000		6 076 000		

For private sector proposal, provide an overview (diagram) of the proposed financing structure.

C.2. Justification of GCF funding request (max. 1 page)

Explain why the Project/ Programme requires GCF funding, i.e. explaining why this is not financed by the public and/ or private sector(s) of the country.

One of the main objectives of the GCF is to contribute to the reduction of greenhouse gases. In this context, Niger would like to contribute to the GCF's efforts by conditional technological options in the "Energy" sector, in a medium and long-term vision, concerning, among other things, energy efficiency. Niger has translated this commitment through the preparation of its INDC document which aims at a conditional GHG reduction of 33,400 GgCO₂ Eq., Or 34.7% compared to the BAU at 2030. To achieve the INDC target two priority sectors including that of energy. Niger is a poor country and ranks last in the UNDP Human Development Index (HDI) rankings. The degradation of the environment added to the impacts of climate change in the short, medium and long term impose significant challenges that these countries will necessarily face at national and community level. Awareness has arisen through the ratification of a number of international conventions such as the United Nations Framework Convention on Climate Change (UNFCCC). Despite the good political will of the country, which has adopted strategies that promote low-carbon technologies including energy efficiency, responses to environmental and climate challenges are still very limited for various reasons such as financial constraints.

The high cost of acquiring low-carbon technologies is a constraint on the realization of solar projects in rural areas where the large proportion of the poor who are seeking well-being live. Without an external mobilization of financial resources, rural areas will continue to suffer the current fate and will exert an increasing pressure on natural resources in search of the livelihoods that could be acquired in case of access to modern energy services. . These populations will remain as long as possible deprived of energy services and socio-economic conditions will continue to deteriorate further. The project is part of the cross-investment priorities to strong impacts of the Green Climate Fund, namely: Transforming production and increase access to energy. Thus, the GCF is asked to lend its financial support in the acquisition of solar equipment and capacity building for the adoption of these technologies in the interest of integrated rural development.

Describe alternative funding options for the same activities being proposed in the Concept Note, including an analysis of the barriers for the potential beneficiaries to access to finance and the constraints of public and private sources of funding.

Funding for project activities could be sought from the state or primary banks. However, Niger is a poor country with a deficit budget. The acquisition costs of solar equipment remain high. There is a lack of capacity in the private sector to finance solar photovoltaic projects in villages due to lack of capital, lack of financial assets, and lack of capacity to raise funds. In addition, default risks for primary banks are higher due to the fact that villages usually include a large number of poor people with very limited incomes.

Justify the rationale and level of concessionality of the GCF financial instrument(s) as well as how this will be passed on to the end-users and beneficiaries. Justify why this is the minimum required to make the investment viable and most efficient considering the incremental cost or risk premium of the Project/ Programme (refer to Decisions B.12/17; B.10/03; and B.09/04 for more details). The justification for grants and reimbursable grants is mandatory.

Niger is one of the Low Developed Countries (LDCs). The country is heavily indebted. These debts represent 52.8% of GDP⁴ in 2018. These debts have been restructured with the HIPC Initiative. This requires the country to receive authorizations from the International Monetary Fund (IMF) to incur new debts. But the IMF does not allow the country to take high-rate loans even if they are concessional. The IMF prefers grants for the country. This limits Niger in its development and particularly in its initiatives to fight against climate change or contribute to the GHG emissions reduction. With regard to climate-related projects, and given the urgency of the needs on the ground, traditional donors in Mali are trying to find donations to finance these projects or, at least, to improve the loans they give to the country. The request for a grant to the GCF to finance this project is a must necessity if the country wants to carry out the project.

In the case of private sector proposal, concessional terms should be minimized and justified as per the Guiding principles applicable to the private sector operations (Decision B.05/07).

C.3. Sustainability and replicability of the project (exit strategy) (max. 1 page)

Please explain how the project/programme sustainability will be ensured in the long run and how this will be monitored, after the project/programme is implemented with support from the GCF and other sources.

Several reasons support the sustainability of this project over time. The use of solar energy in the development of socio-economic activities will improve not only the standard of living of the beneficiaries but also their level of understanding of issues related to clean and sustainable energy. The beneficiary populations who are in an inestimable need, will have another vision of the implementation of this project. The capacity building and training activities of the beneficiaries will enable them to own the technology. These training activities will allow the emergence of entrepreneurs in the field of solar energy. This will create jobs in the beneficiary areas but also support the socio-economic development of villages. It should also be noted that the project is in its first phase, which means that taking into account sustainability in this project is an essential point. Therefore, Component 3 is formulated to support this sustainability. It is a component of rigorous monitoring and evaluation of the activities developed and dissemination of lessons learned. This component aims to promote a strong penetration of renewable energies in the supply of energy services. Beneficiaries will also be trained on entrepreneurship and business management techniques. This will support the viability of the activities developed by the project.

For non-grant instruments, explain how the capital invested will be repaid and over what duration of time.

D. Supporting documents submitted (OPTIONAL)

- Map indicating the location of the project/programme
- Diagram of the theory of change
- Economic and financial model with key assumptions and potential stressed scenarios
- Pre-feasibility study
- Evaluation report of previous project
- Results of environmental and social risk screening

Self-awareness check boxes

Are you aware that the full Funding Proposal and Annexes will require these documents? Yes No

- Feasibility Study
- Environmental and social impact assessment or environmental and social management framework
- Stakeholder consultations at national and project level implementation including with indigenous people if relevant
- Gender assessment and action plan
- Operations and maintenance plan if relevant
- Loan or grant operation manual as appropriate
- Co-financing commitment letters

⁴ FMI - World Economic Outlook Database - <http://www.expert-comptable-international.info/fr/pays/>

Are you aware that a funding proposal from an accredited entity without a signed AMA will be reviewed but not sent to the Board for consideration? Yes No